299-E33-69 (A6877)

Log Data Report

Borehole Information:

Borehole:	299-E33-69 (A6877)		Site:	216-B-8 Crib	
Coordinates		GWL (ft)[1]:	Not Reached	GWL Date:	
North	East	Drill Date	TOC[2] Elevation	Total Depth (ft)	Type
137455	573786	Dec. 1947	636.46 ft	150	

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Steel	2.85	8.625	8.0	.3125	0	145

Borehole Notes:

The logging engineer measured the pipe stickup at the borehole using a steel tape. Calipers were used to measure casing outside diameter and thickness, the casing inside diameter is calculated.

Logging Equipment Information:

Logging System:	Gamma 1D		Type: SGLS (35%)
Calibration Date:	09/00	Calibration Reference:	GJO-2001-243-TAR
		Logging Procedure:	MAC-HGLP 1.6.5

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2	3	4	5
Date	10/4/01	10/5/01	10/8/01		
Logging Engineer	Musial	Musial	Musial		
Start Depth (ft)	3.0	150.0	65.0		
Finish Depth (ft)	66.0	83.0	84.0		
Count Time (sec)	100	100	100		
Live/Real	R	R	R		
Shield (Y/N)	n/a[3]	n/a	n/a		
MSA Interval (ft)	0.5	0.5	0.5		
ft/min	n/a	n/a	n/a		
Pre-Verification	A0008CAB	A0009CAB	A0010CAB		
Start File	A0008000	A0009000	A0010000		
Finish File	A0008126	A0009134	A0010038		
Post-Verification	A0008CAA	A0009CAA	A0011CAA		
Depth Return Error (ft)	0	0.15	0		
Comments	No fine gain adjustments	No fine gain adjustments	No fine gain adjustments		

Logging Operation Notes:

Zero reference is the top of casing.

Analysis Notes:

Analyst:	Sobczyk	Date:	10/10/01	Reference:	MAC-VZCP 1.7.9 Rev. 2

Pre-run and post-run verification spectra for the SGLS were evaluated. The acceptance criteria for field verification of the Gamma 1D logging system are in the process of being established. Examinations of spectra indicate that the detectors appear to have functioned normally during the log runs, and the log data are provisionally accepted, subject to further review and analysis.

Individual spectra were processed in batch mode using APTEC Supervisor. Concentrations were calculated in EXCEL, using parameters determined from analysis of calibration data collected in August 2000. The casing configuration was assumed to be one string of 8-in. casing with a thickness of 5/16 in. These assumptions are consistent with the logging engineer's measurements. A correction for water in the borehole was not applied. Dead time corrections were applied where necessary.

Dead time was greater than 40 percent in the interval from 28.0 to 49.0 ft. Data from this region are considered unreliable. Dead time corrections were required where the tool was not saturated. At dead time greater than 40 percent, peak spreading and pulse pile-up effects may result in underestimation of activities. This effect is not entirely corrected by the dead time correction, and the extent of error increases with increasing dead time.

Log Plot Notes:

Separate log plots are provided for gross gamma and dead time, naturally occurring radionuclides (^{40}K, ^{238}U, and ^{232}Th), and ^{137}Cs. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, or casing correction. These errors are discussed in the calibration report. A combination plot is also included to facilitate correlation.

Results and Interpretations:

^{137}Cs, which is a man-made radionuclide, was detected in three zones. A zone of ^{137}Cs contamination was detected near the ground surface (log depth 3.0 through 8.0 ft) with activities ranging from 0.3 to 53.3 pCi/g. ^{137}Cs occurred between 25.5 and 115.0 ft. In this interval, activities exceeded 1,000 pCi/g in the interval between 28.5 and 55.0 ft. At the bottom of the borehole (150.0-ft log depth), ^{137}Cs was detected with an activity of 0.6 pCi/g and may be contamination that blew into the borehole.

Above the zone of intense gamma ray activity, apparent ^{40}K activities are about 12 pCi/g. Within the zones of intense gamma ray activity, apparent ^{40}K activities are about 18 pCi/g. The relatively high concentrations of Cs-137 below about 30 ft may correspond with the increase in ^{40}K activities and the transition from the coarse-grained sediments of the Hanford H1 to the finer grained sediments of the Hanford H2.

Because of the high activities encountered by the SGLS, the interval from 27.0 to 57.0 ft should be logged with the High Rate Logging System.

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[1] GWL – groundwater level
[2] TOC – top of casing
[3] n/a – not applicable

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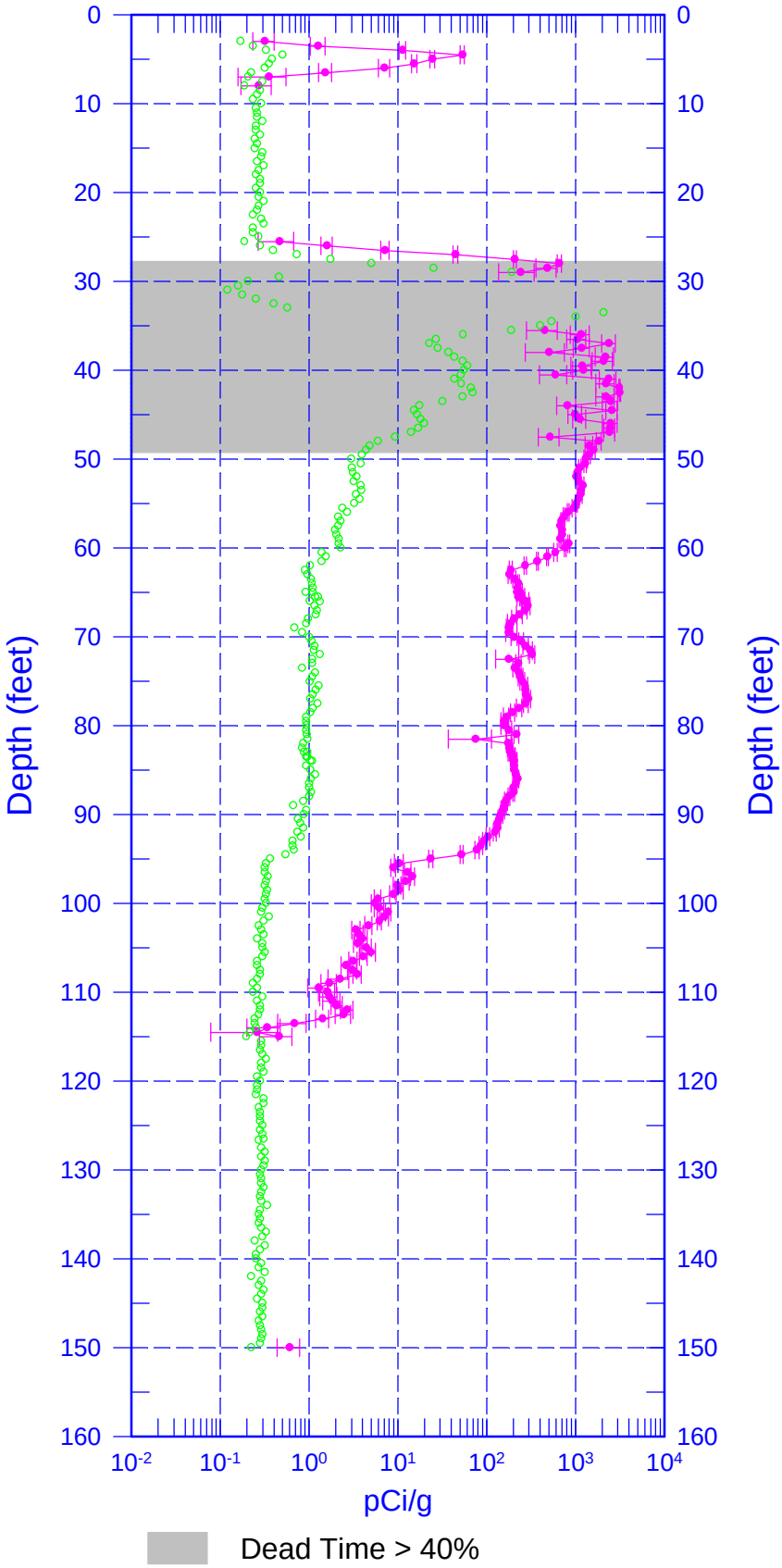
Man-Made Radionuclide

^{137}Cs (662 keV)



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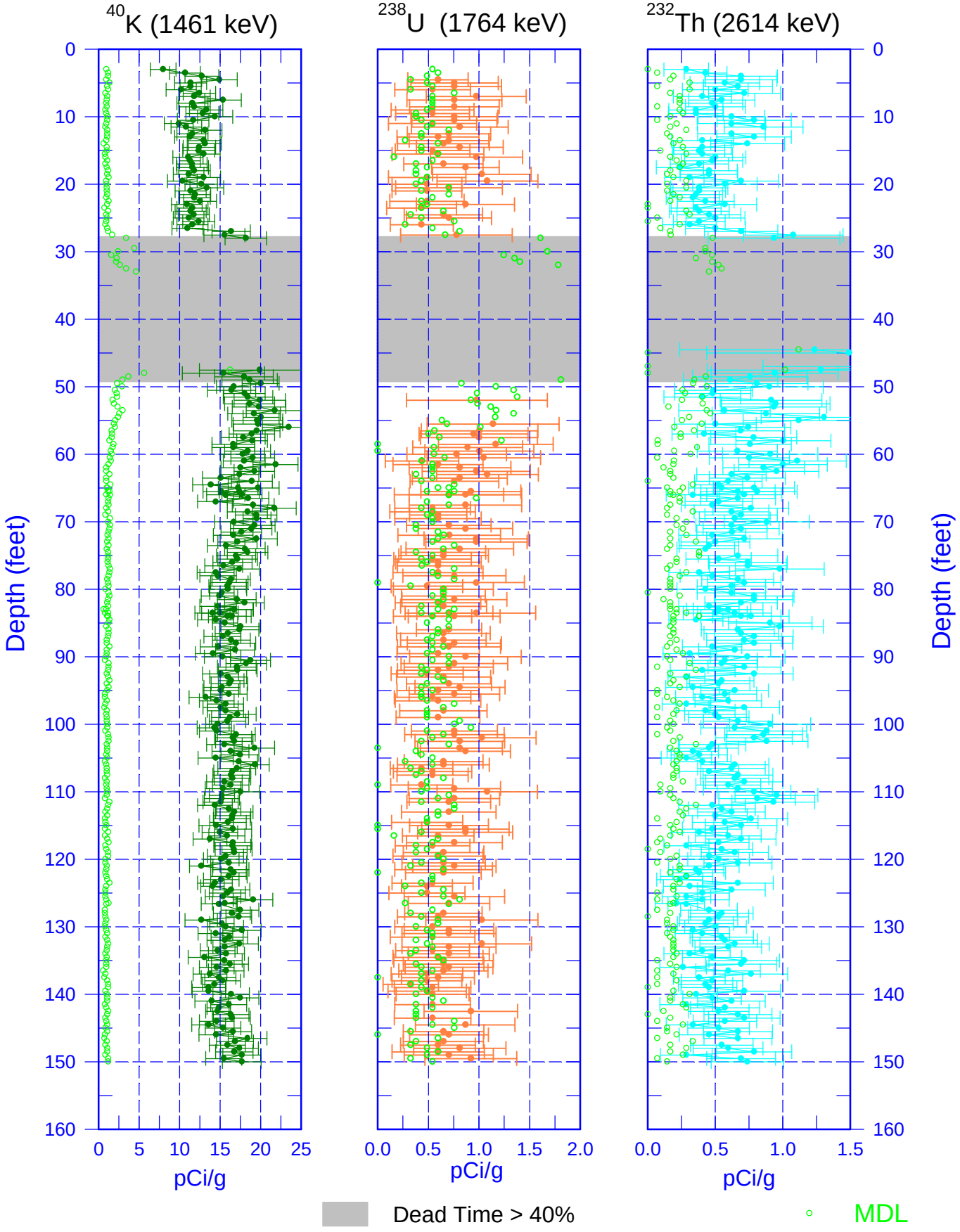
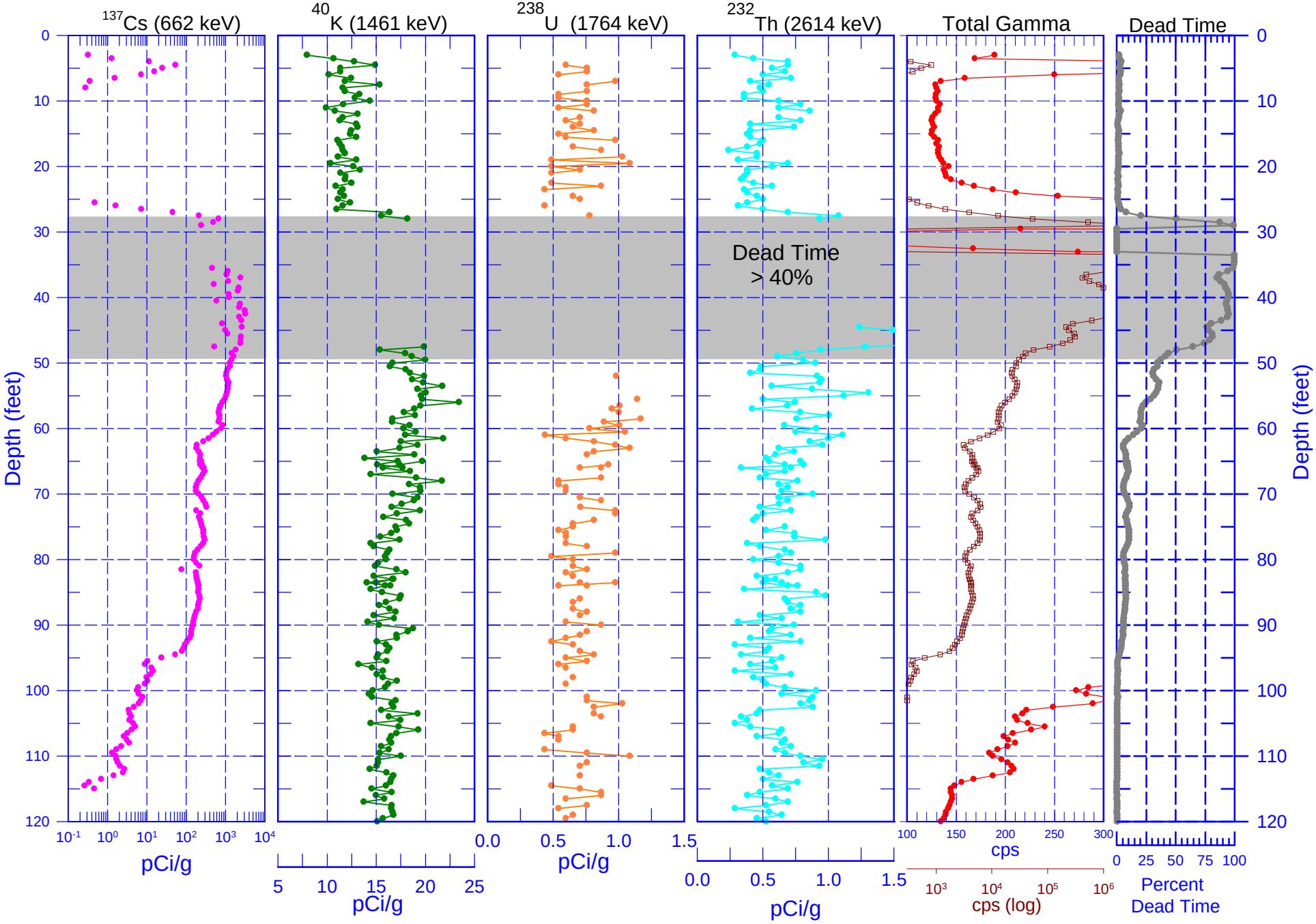
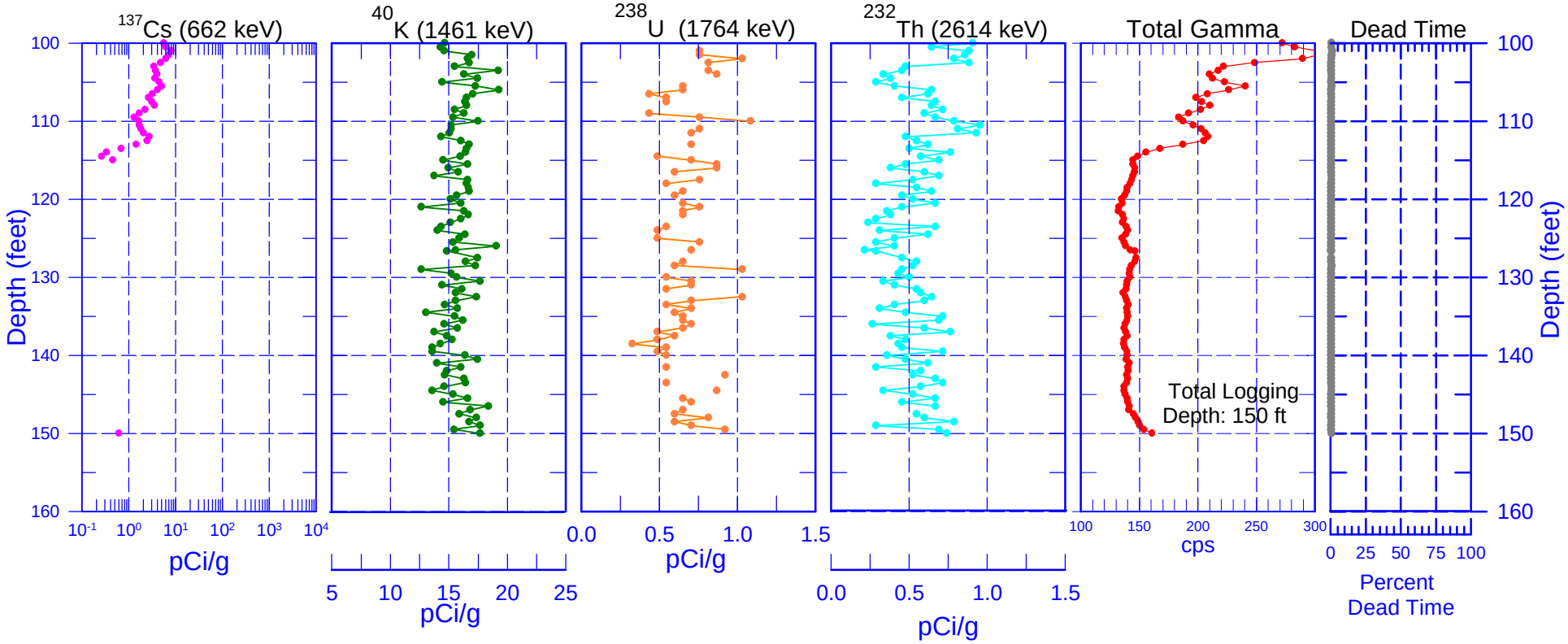
Natural Gamma Logs



299-E33-69 (A6877) Combination Plot



299-E33-69 (A6877)
Combination Plot



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Total Gamma & Dead Time